RF and mmWave Circuit Design

MEASUREMENT EQUIPMENT

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Time Domain Measurements

→ **Function generator**

Generates electrical waveforms such as sine waves, triangular waves, square wave.

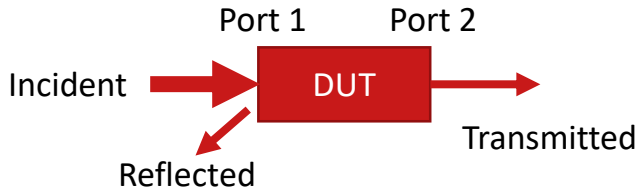
→ **Oscilloscope**

Displays time-varying signal voltage graphically. Most modern osc. can also analyze the signal.

RF Network Measurements

→ **Vector Network Analyzer (VNA)**

Provides an incident signal into the DUT and measures the resulting reflected and transmitted signals.

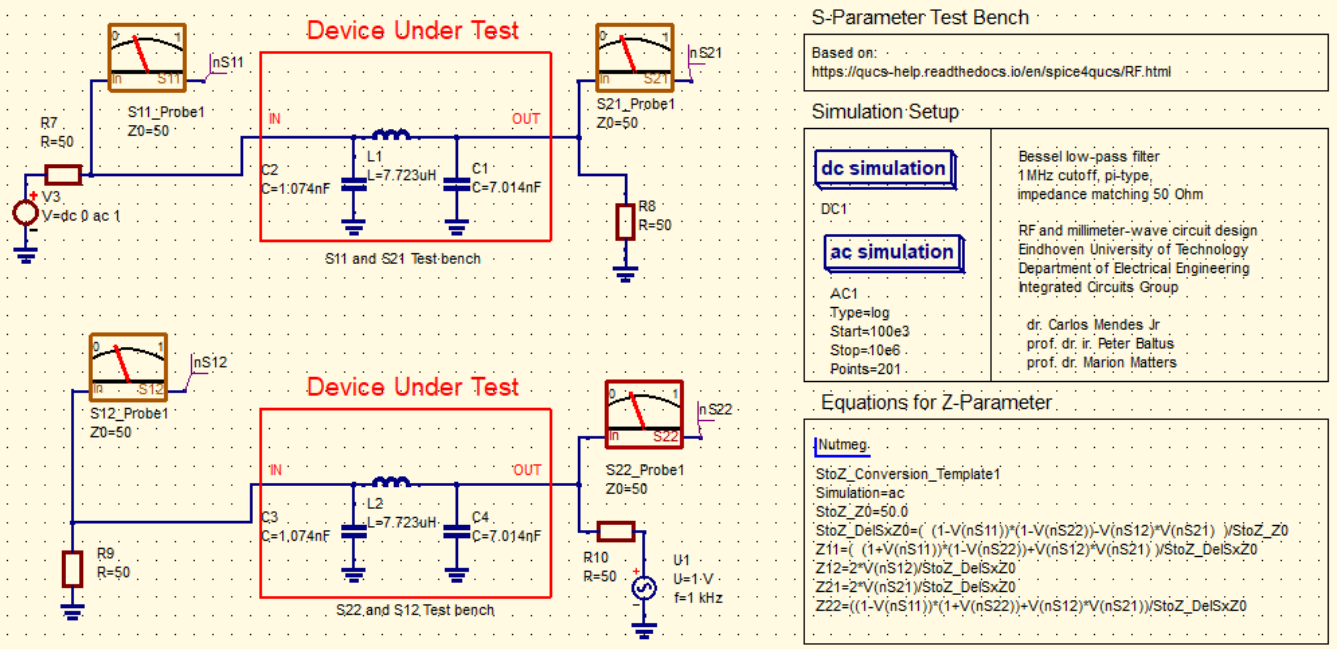


1. Perform the RF Calibration
2. Measure 1 MHz LPF

RF Network Measurements

→ **QUCS-S Simulation**

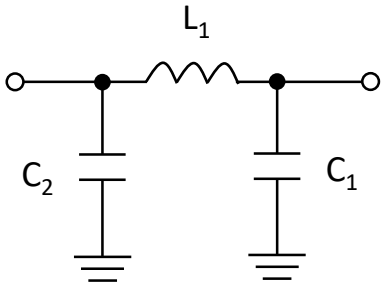
Testbench for S-Parameter simulation using QUCS-S and Ngspice.



Folder: SP_TestBench_prj

RF Network Measurements

→ **Low Pass Filter**



$f_c = 1\ MHz$

$50\ \Omega$ ports

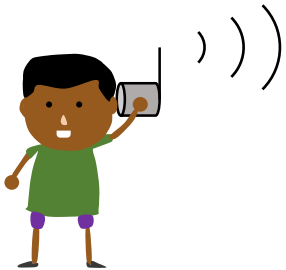
Calculated values used in simulation:

- $L_1 = 7.723\ uH$
- $C_1 = 7.014\ nF$
- $C_2 = 1.074\ nF$

Commercial values used in measurement:

- $L_1 = 10.0\ uH$
- $C_1 = 6.8\ nF$
- $C_2 = 1.0\ nF$

Thanks for watching!



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